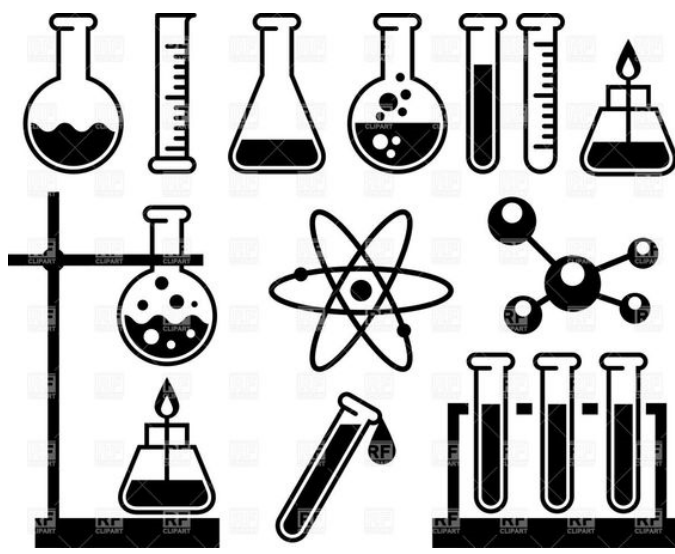


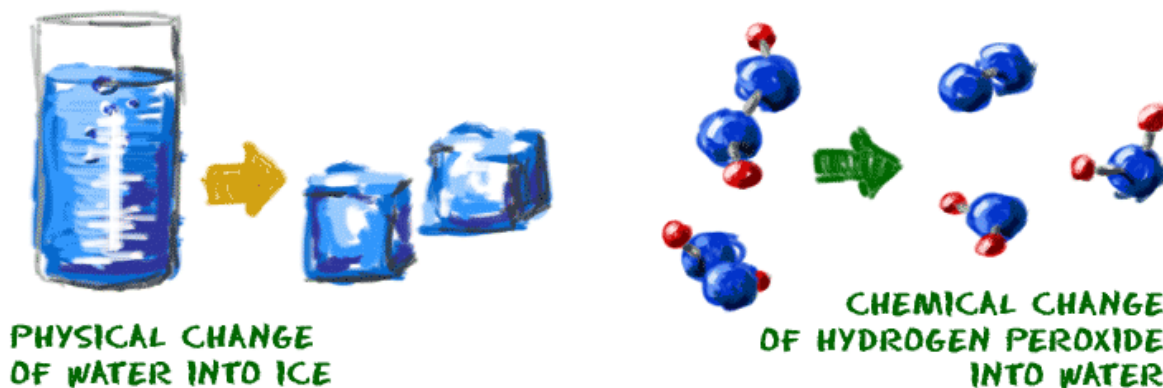
Part 6

Chemical Changes versus Physical Changes



Chemical Changes Versus Physical Changes

It is important to understand the difference between chemical and physical changes.



Physical changes are usually about states and physical states of states.

When you step on a can and crush it, you have forced a physical change. However, you only changed the shape of the can. It wasn't a change in the state of matter because the energy in the can did not change. Also, since this was a physical change, the molecules in the can are still the same molecules. No chemical bonds were created or broken.

When you melt an ice cube (H_2O), you have a physical change because you add energy. In this example, you added enough energy to create a phase change from solid to liquid. Physical actions, such as changing temperature or pressure, can cause physical changes. No chemical changes took place when you melted the ice. The water molecules are still water molecules.

Chemical changes happen on a molecular level when you have two or more molecules that interact. Chemical changes happen when atomic bonds are broken or created during chemical reactions.

Chemical changes usually cannot be reversed. Meaning that once the change has occurred you would not be able to change the items back to the way they were.

Iron (Fe) rusts when it is exposed to oxygen gas in the air. You can watch the process happen over a long period of time. The molecules change their

structure as the iron is oxidized, eventually becoming iron oxide (Fe_2O_3). Rusty pipes in abandoned buildings are real world examples of the oxidation process.

How to tell a chemical change has occurred.

1. Bubbles of gas appear
2. A precipitate has formed
3. A color change occurred
4. The temperature has changed
5. Light is emitted
6. It is a different size
7. It has a different smell or taste.